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EXAMINER	
LAM, ANN Y	

ART UNIT	PAPER NUMBER
1641	

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/960,716	TCHAGA, GRIGORIY S.	
	Examiner	Art Unit	
	Ann Y. Lam	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Claims 2 and 20-45 are canceled.

Claims 1 and 3-19 are pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 3-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites in lines 5 through 6 "said sample comprises a metal ion chelating polysaccharide". Claim 1 appears to be reciting that the sample initially, or naturally, has metal ion chelating polysaccharide, i.e., without any addition of the metal ion chelating polysaccharide to the sample. However, in the specification on page 28, lines 27 through 29, Applicant discloses that the sample is pre-incubated with an incubation buffer that includes the metal ion chelating polysaccharide to produce a preincubated analyte containing sample. Thus, it appears that Applicant intends for the "sample" in claim 1 to pre-incubated with a metal ion chelating polysaccharide rather than initially or naturally containing the metal ion chelating polysaccharide (and thus will be interpreted this way for purposes of examination.) However, whether the sample initially/naturally

has the metal ion chelating polysaccharide or whether the polysaccharide is added to the sample is not clear in claim 1.

Claims 1 and 3-19 are rejected under 112, second paragraph, because they depend from claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1, 3-5, 12, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Margherita, 4,111,656, in view of Zarling et al., 5,674,698, and further in view of Kartel et al., "Evaluation of Pectin Binding of Heavy Metal Ions in Aqueous Solutions", Chemosphere, Vol. 38, No. 11, pp. 2591-2596, 1999.

Margherita teaches the invention substantially as claimed. More specifically, as to claims 1 and 3 through 5, Margherita teaches a method of determining whether a sample includes an analyte of interest, said method comprising:

contacting said sample with a plurality of distinct binding agents (see col. 5, lines 47-51) wherein said sample comprises a metal ion chelating agent (i.e., chelating agent, such as ethylene tetraacetic acid, i.e., EDTA, see col. 5, lines 9-21),

wherein each of said binding agents at least comprises a specific epitope binding domain of an antibody (see col. 5, line 50);

detecting the presence of any resultant binding complexes on said surface to obtain analyte binding data (see col. 5, lines 54-56);

and employing said analyte binding data to determine whether said sample includes said at least one analyte of interest (see col. 5, lines 57-58).

However, Margherita does not teach that the antibody is bound to a solid support in an array.

Zarling et al. however teach that heterogeneous assays are usually preferred and are generally more sensitive and reliable than homogenous assay (col. 20, lines 33-35). Zarling et al. also give an example of a radioimmunoassay (col. 20, lines 25-26). Also, as an example, Zarling et al. disclose a solid substrate having a plurality of distinct species of first binding component in an array of peptides and then contacting the solid support with an analyte solution and detecting subsequent binding (col. 23, line 62 – col. 24, line 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Margherita assay, which is disclosed as a homogenous assay, such that the antibodies are immobilized on a solid phase in a heterogenous assay as taught by Zarling et al. because Zarling et al. teach that heterogeneous assays are preferred because they are more sensitive and reliable than homogenous assays. Given the disclosure by Zarling et al. of a heterogeneous radioimmunoassay, one of ordinary skill in the art would have reasonable expectation of

success in modifying the Margherita assay into a heterogeneous assay as taught by Zarling et al.

Zarling et al. also teach, as to dependent claim 12, a plurality of washings steps between said contacting and detecting steps by teaching that bound complexes are typically isolated from unbound material prior to detection and usually by incorporating at least one washing stop to removed background signal attributable to label present in unbound material (col. 20, lines 61-64), and giving an example of washing twice (col. 51, lines 59-60).

Also, as to independent claim 1, although Margherita teaches that the buffer solution contains a chelating agent for chelating unwanted metal ions and discloses ethylenediamine tetraacetic acid, i.e., EDTA, as an example (col. 5, lines 17-21), Margherita does not teach that the metal chelating agent may be a polysaccharide, such as apple pectin (as claimed in claims 1, 3-5 and 14-16). However, Kartel et al. teach the motivation to use a polysaccharide, such as apple pectin.

Kartel et al. teach that polysaccharides such as apple pectin is a metal chelator that has a high selectivity for certain metals (see page 2591-2592 and page 2595). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize apple pectin as the metal ion chelator generally disclosed by Kartel et al. as the specific metal ion chelator generally disclosed by Margherita because Kartel et al. teach that apple pectin exhibits high selectivity towards metal ions and is efficient in absorbing metal ions.

As to claim 18, Margherita discloses that the method further comprises a sample fractionating step prior to said contacting step (see col. 12, lines 3-11, disclosing extraction in a chromatographic column in a buffer).

As to claim 19, Margherita discloses that the fractionating step comprises contacting said sample with at least one affinity column (see col. 12, lines 3-11).

2. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Margherita, 4,111,656, in view of Zarling et al., 5,674,698, and further in view of Kartel et al., "Evaluation of Pectin Binding of Heavy Metal Ions in Aqueous Solutions", Chemosphere, Vol. 38, No. 11, pp. 2591-2596, 1999, Schoemaker et al., 4,837,167, and Pronovost et al., 5,773,234.

Margherita in view of Zarling et al. and Kartel et al. disclose the invention substantially as claimed (see above with respect to claim 1). While Margherita does teach that the assay method may include extracting the analyte using a buffer (see col. 12, line 10). While Margherita discloses extracting an analyte from a cellular source (see for example, col. 12, line 3), Margherita does not disclose labeling the extracted analyte, wherein said extracting and labeling steps employ the same buffer composition.

However, Schoemaker et al. teach that labeling an analyte prior to the step of contacting the analyte to the immobilized probed provides the advantage of eliminating a washing step and an improvement in kinetics of the reaction (see col. 2, lines 15-35). It would have been obvious to one of ordinary skill at the time the invention was made to label the analyte in the invention taught by Margherita in view of Zarling et al. and Kartel

et al. as taught by Schoemaker et al. because Schoemaker et al. teach that this provides the advantages of eliminating a washing step and improving reaction kinetics.

Also, as to the limitation regarding employing the same buffer composition for the extraction and labeling step, Pronovost et al. teach this limitation.

Pronovost et al. teach using a buffer in an extraction step, the buffer increasing the sensitivity of the assay, and preferably using the same buffer composition during labeling (col. 4, lines 48-61). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the same buffer composition in the invention taught by Margherita in view of Zarling et al. and Kartel et al. because Pronovost et al. teach that using the same buffer, which increases sensitivity of the assay, in the labeling step is preferable. Given the teachings of Pronovost et al. of using the same buffer composition for the extraction step as the labeling step, one of ordinary skill in the art would have reasonable expectation of success in utilizing the same buffer for the extraction and labeling step in the invention taught by Margherita in view of Zarling et al. and Kartel et al.

As to the following claims, Margherita teaches the following regarding the buffer.

As to claim 7, said buffer composition is free of components that include primary amine moieties (col. 5, lines 17-22.)

As to claim 8, said buffer composition has a pH ranging from about 7 to about 12 (col. 5, lines 21-22.)

As to claim 9, while Margherita teaches that the buffer containing metal chelating polysaccharide is used in the assay (col. 12, lines 26-37), and Margherita also teaches

extracting proteins from a cellular source using a buffer in a chromatographic column (see col. 12, lines 1-12), Margherita does not specify what comprises the extraction buffer nor that that the buffer composition is capable of extracting at least about 95% of the proteins of an initial cellular source. However, Pronovost et al. teach using the same buffer, which increases sensitivity of the assay, in the labeling step and capturing step is preferable. Given the teachings of Pronovost et al. of using the same buffer composition for the extraction step as the labeling step and capturing step (see col. 4, lines 58-61), one of ordinary skill in the art would have reasonable expectation of success in utilizing the same buffer for the assay or capturing step as for the extraction step. As to extracting at least 95% of the proteins form the cellular source, while Margherita does not disclose this, Marherita does disclose an extraction step using a chromatographic column (see col. 12, lines 1-12). Also, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 1-5 USPQ 233. In this case, Margherita in view of Zarling et al., Kartel et al., Schoemaker et al. and Pronovost et al. discloses the general conditions of the claim and extracting at least 95% of the proteins from the cellular source is an optimum or workable range (e.g., utilizing the chromatographic column and buffer) and thus involves only routine skill in the art.

3. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Margherita, 4,111,656, in view of Zarling et al., 5,674,698, and further in view of Kartel

et al., "Evaluation of Pectin Binding of Heavy Metal Ions in Aqueous Solutions", Chemosphere, Vol. 38, No. 11, pp. 2591-2596, 1999, and Wohlstadter et al., 6,207,369.

Margherita in view of Zarling et al. and Kartel et al. teach the invention substantially as claimed (see above with respect to claim 1), except for determining the presence of at least two distinct analytes in said sample.

However, Wohlstadter et al teach that an array of immobilized probes may have different geometric shapes representing binding domains specific for different analytes (col. 8, lines 20-23). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide different probes in the array in the invention taught by Margherita in view of Zarling et al. and Kartel et al. because Wohlstadter et al. teach that such an array of probes bind to different analytes. One of ordinary skill in the art would recognize that the array provides the benefit of detecting more than one analyte.

4. Claims 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Margherita, 4,111,656, in view of Zarling et al., 5,674,698, and further in view of Kartel et al., "Evaluation of Pectin Binding of Heavy Metal Ions in Aqueous Solutions", Chemosphere, Vol. 38, No. 11, pp. 2591-2596, 1999, Schoemaker et al., 4,837,167, and Pronovost et al., 5,773,234, and Wohlstadter et al., 6,207,369.

As to claims 13-16, Margherita in view of Zarling et al. and Kartel teach the invention substantially as claimed (see above with respect to claim 1).

While Margherita does teach that the assay method may include extracting the analyte from a cellular source using a buffer (see col. 12, lines 3-10), Margherita does not disclose labeling the extracted analyte, wherein said extracting and labeling steps employ the same buffer composition.

However, Schoemaker et al. teach that labeling an analyte prior to the step of contacting the analyte to the immobilized probed provides the advantage of eliminating a washing step and an improvement in kinetics of the reaction (see col. 2, lines 15-35). It would have been obvious to one of ordinary skill at the time the invention was made to label the analyte in the invention taught by Margherita in view of Zarling et al. and Kartel et al. as taught by Schoemaker et al. because Schoemaker et al. teach that this provides the advantages of eliminating a washing step and improving reaction kinetics.

Also, Margherita and Zarlng et al. and Kartel et al. do not teach employing the same buffer composition for the extraction and labeling step. However Pronovost et al. teach this limitation.

Pronovost et al. teach using a buffer in an extraction step, the buffer increasing the sensitivity of the assay, and preferably using the same buffer composition during labeling (col. 4, lines 48-61). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the same buffer composition in the invention taught by Margherita in view of Zarling et al. and Kartel et al. because Pronovost et al. teach that using the same buffer, which increases sensitivity of the assay, in the labeling step is preferable. Given the teachings of Pronovost et al. of using the same buffer composition for the extraction step as the labeling step, one of ordinary

skill in the art would have reasonable expectation of success in utilizing the same buffer for the extraction and labeling step in the invention taught by Margherita in view of Zarling et al. and Kartel et al.

Also, Margherita does not teach determining the presence of at least two distinct analytes in said sample.

However, Wohlstadter et al. teach that an array of immobilized probes may have different geometric shapes representing binding domains specific for different analytes (col. 8, lines 20-23). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide different probes in the array in the invention taught by Margherita (in view of Zarling et al., Kartel et al., Schoemaker et al., and Pronovost et al.) because Wohlstadter et al. teach that such an array of probes bind to different analytes. One of ordinary skill in the art would recognize that the array provides the benefit of detecting more than one analyte.

5. Claims 1, 3-5, 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velander et al., 5,328,603, in view of Zarling et al., 5,674,698, and further in view of Kartel et al., "Evaluation of Pectin Binding of Heavy Metal Ions in Aqueous Solutions", Chemosphere, Vol. 38, No. 11, pp. 2591-2596, 1999.

Velander et al. teach the invention substantially as claimed. More specifically, as to claims 1, 3-5 and 13-16, Velander et al. teach a method of determining whether a sample includes an analyte of interest, said method comprising:

contacting said sample with a plurality of distinct binding agents (antibody 7D7, see col. 13, line 39) wherein said sample comprises a metal ion chelating agent (EDTA, col. 13, line 59),

wherein each of said binding agents at least comprises a specific epitope binding domain of an antibody (col. 13, line 39);

detecting the presence of any resultant binding complexes on said surface to obtain analyte binding data (col. 14, lines 3-16);

and employing said analyte binding data to determine whether said sample includes said at least one analyte of interest (col. 14, lines 3-16).

While Velander et al. teach that the protein 7D7 is bound to a bead as the solid support, Velander et al. however do not teach that the protein may be bound to a solid support in an array.

Zarling et al. however teach that solid supports may be in the form of beads (see for example col. 23, line 57-58) or a solid substrate having a plurality of distinct species of first binding component in an array of peptides (col. 23, line 62 – col. 24, line 5). Zarling et al. teach that one or more of the binding species may bind to a particular analyte that is in contact with the solid support having the array of species (col. 23, lines 64-67), and that multiple distinct analytes may be detected (see col. 24, lines 6-17).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a solid support having an array of binding species as taught by Zarling et al. because Zarling et al. teach that such a solid support having an array of probes as an alternative embodiment wherein the solid support is a bead, such

as the Velander et al. beads. Also, Zarling et al. teach that the solid support may have an array of different probes that bind to different analytes. One of ordinary skill in the art would recognize that the solid support having an array of probes provides the same function of immobilizing probes as beads, and that an array of different probes provides the benefit of detecting a plurality of analytes, as would be desirable for convenience.

Also, as to independent claim 1, although Velander et al. teach that because the protein 7D7 only binds protein C and prothrombin in the absence of metal ions, a buffer is used that contains a chelating agent, and gives an example of ehtylenediaminetetraacetic acid (EDTA) as a chelating agent, (see col. 13, lines 56-59), Velander et al. do not teach that the metal chelating agent may be a polysaccharide, such as apple pectin (as claimed in claims 1, 3-5 and 14-16). However, Kartel et al. teach the motivation to use a polysaccharide, such as apple pectin.

Kartel et al. teach that polysaccharides such as apple pectin is a metal chelator that has a high selectivity for certain metals (see page 2591-2592 and page 2595). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize apple pectin as the metal ion chelator generally disclosed by Kartel et al. as the specific metal ion chelator generally disclosed by Velander et al. because Kartel et al. teach that apple pectin exhibits high selectivity towards metal ions and is efficient in absorbing metal ions.

As to claim 10, Velander et al. disclose that the analyte is a protein (protein C, col. 13, line 56).

As to claim 12, Velander et al. disclose a plurality of washings steps between said contacting and detecting steps (col. 13, lines 63-64, and lines 67-68, and col. 1, lines 1-2).

6. Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velander et al., 5,328,603, in view of Zarling et al., 5,674,698, and further in view of Kartel et al., "Evaluation of Pectin Binding of Heavy Metal Ions in Aqueous Solutions", Chemosphere, Vol. 38, No. 11, pp. 2591-2596, 1999, Schoemaker et al., 4,837,167, and Pronovost et al., 5,773,234, and Wohlstadter et al., 6,207,369.

As to claims 13-16, Velander et al. in view of Zarling et al. and Kartel teach the invention substantially as claimed (see above under subheading 5), except for extracting the analyte from a cellular source in an extraction buffer and labeling the analyte in a buffer that is the same as the extraction buffer.

However, Schoemaker et al. teach that labeling an analyte prior to the step of contacting the analyte to the immobilized probed provides the advantage of eliminating a washing step and an improvement in kinetics of the reaction (see col. 2, lines 15-35). It would have been obvious to one of ordinary skill at the time the invention was made to label the analyte in the invention taught by Velander et al. in view of Zarling et al. and Kartel et al. as taught by Schoemaker et al. because Schoemaker et al. teach that this provides the advantages of eliminating a washing step and improving reaction kinetics.

Also, Velander et al. and Zarlng et al. and Kartel et al. do not teach employing the same buffer composition for the extraction and labeling step. However Pronovost et al. teach this limitation.

Pronovost et al. teach using a buffer in an extraction step, the buffer increasing the sensitivity of the assay, and preferably using the same buffer composition during labeling (col. 4, lines 48-61). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the same buffer composition in the invention taught by Velander et al. in view of Zarling et al. and Kartel et al. because Pronovost et al. teach that using the same buffer, which increases sensitivity of the assay, in the labeling step is preferable. Given the teachings of Pronovost et al. of using the same buffer composition for the extraction step as the labeling step, one of ordinary skill in the art would have reasonable expectation of success in utilizing the same buffer for the extraction and labeling step in the invention taught by Velander et al. in view of Zarling et al. and Kartel et al.

Also, Velander et al. do not teach determining the presence of at least two distinct analytes in said sample.

However, Wohlstadter et al. teach that an array of immobilized probes may have different geometric shapes representing binding domains specific for different analytes (col. 8, lines 20-23). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide different probes in the array in the invention taught by Velander et al. (in view of Zarling et al., Kartel et al., Schoemaker et al., and Pronovost et al.) because Wohlstadter et al. teach that such an array of probes bind to

different analytes. One of ordinary skill in the art would recognize that the array provides the benefit of detecting more than one analyte.

As to claim 17, Velander et al. teach that the method is considered a method of determining a protein expression profile for the sample (col. 13, line 56).

Response to Arguments

Applicant's arguments with respect to the above rejected claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ann Y. Lam whose telephone number is 571-272-0822. The examiner can normally be reached on Mon.-Fri. 10-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A.L. 6/6/06

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